

REMARKS

This application is amended in a manner to place it in condition for allowance at the time of the next Official Action.

Claims 1-12 are amended. The amendment to the claims is formal in nature so as to address the claim objections and the definite rejection.

Claims 1-12 remain pending in the application.

The Official Action objects to claims 1-12 for the following recitations: "characterized in that", "pricking out", and "Recombinant plants" in the preamble.

These recitations have been amended so as to be consistent with U.S. patent practice.

Therefore, withdrawal of the objection is respectfully requested.

Claims 1-12 are rejected under 35 USC 112, second paragraph, as being indefinite.

Specifically, claim 1 is rejected for lacking a correlation between the preamble and the last method step, as well as reciting a broad range and a narrow range within the same claim.

Claim 2 is rejected for reciting "the resulting young chicories" without antecedent basis in claim 1.

Claim 5 is rejected for reciting "the resulting young recombinant chicories" without antecedent basis in claim 4.

Accordingly, the claims are amended to recite the features in a definite manner.

Therefore, withdrawal of the definiteness rejection is respectfully requested.

Claims 1-12 are rejected under 35 USC 103(a) as being unpatentable over DELESALLE et al. 6,803,497 ("DELESALLE") in view of SIDIKOU-SEYNI et al. 1992 ("SIDIKOU-SEYNI") and CASTANO et al. 1997 ("CASTANO"). This rejection is respectfully traversed.

As it is stated on page 1, lines 31-33 of the specification, the claimed invention flows from the fact that endive producers are seeking novel products for diversifying their offer and allowing them to make available a varied range of endives to the final consumers.

As it is explained on page 2, lines 12-15 of the specification, in order to make available for the consumers a novel and varied range of plants derived from endive, able to be marketed at reasonable costs, it is required that the novel plants should be adapted to the production conditions being traditionally used for the endive, namely be adapted to cultivating through forcing.

Those technical problems and needs of the public have been solved by designing the claimed method and by making available to the public the claimed recombinant plants.

The position of the Official Action is that one skilled in the art would have been taught by DELESALLE a method for producing recombinant chicory plants by crossing two chicory plant species. Further, one skilled in the art would have been incited by SIDIKOU-SEYNI to use the method of DELESALLE by performing a cross breeding between *Cichorium intybus* with *Cichorium endivia* in view of producing *Cichorium hybrids*, since SIDIKOU-SEYNI would have allegedly taught that those hybrids were phenotypically normal and fertile. Finally, one skilled in the art would have been confirmed in the above choice by CASTANO which would have taught to him the importance of chicories in agricultural food industry.

As recognized in the Official Action, the claimed method is not anticipated by any of the cited publications.

The cited publications are discussed in greater detail below:

DELESALLE

DELESALLE discloses a method of producing a chicory plant that exhibits cytoplasmic male sterility comprising the following steps:

(a) introducing into cells of a chicory plant a mitochondrion of a male sterile plant that comprises the orf 522 sequence of *helianthus annuus*;

(b) regenerating chicory plants; and

(c) identifying a chicory plant comprising a 347 bp fragment of said orf 522 comprising the nucleotide sequences of SEQ ID NO: 1 and SEQ ID NO: 2 (see claim 1).

DELESALLE also discloses a method of producing a chicory plant cell comprising a step of fusing chicory plant cells with cells of a second plant cell.

Example 1 discloses a production of plant of the chicory phenotype wherein some plants show male sterility phenotype through a first step of protoplast fusion.

Example 2 discloses the DNA analysis of various populations of chicories which have shown that a DNA sequence names "orf 522" is not present in fertile chicories.

DELESALLE teaches a method of producing recombinant chicories with cytoplasmic male sterility originating from *Helianthus annuus*, i.e. from sunflowers. The result of DELESALLE's teaching is whether a *Cichorium intybus* with cytoplasmic male sterility originates from *Helianthus annuus* or a *Cichorium endivia* with cytoplasmic male sterility originates from *Helianthus annuus*. Claims 9 and 10 of DELESALLE relate to a further cross from a chicory plant having the CMS characteristic, but a further cross with a *Cichorium intybus* when the chicory plant having the CMS characteristic is already a *Cichorium intybus* or a further cross with a *Cichorium endivia* when the chicory plant having the CMS characteristic is already a *Cichorium endivia*.

However, DELESALLE fails to teach or suggest crossing *Cichorium endivia* with *Cichorium intybus*.

Indeed, the method of DELESALLE implies introducing into cells of a chicory plant a mitochondrion of a male sterile plant that comprises the orf 522 of *Helianthus annuus*. As shown in Example 1 of DELESALLE, such a method uses protoplast fusion between protoplasts from chicory and protoplasts from *Helianthus annuus*.

Thus, the recombinant plant of DELESALLE is a recombinant plant between a chicory and *Helianthus annuus*, obtained through protoplast fusion, while the recombinant plants of the claimed invention are recombinant plants between *Cichorium endivia* and *Cichorium intybus*, obtained accordingly to the multi-step method of claim 1.

Both the plant material and the method used in the claimed invention are different from those of DELESALLE. One skilled in the art would not have modified a method implying fusion of both chicory and sunflower cells to produce the multi-step method according to the invention for producing recombinant plants between *Cichorium endivia* and *Cichorium intybus*.

As it can be seen from DELESALLE, the sole method of producing plants exclusively consists of a method comprising (i) a step of fusing protoplasts derived from two plants and then (ii) a step of generating plants starting from the previously fused protoplasts.

Consequently, there is strictly no step in common between the method disclosed by DELESALLE and the presently claimed method.

Thus, it would have been unlikely that one skilled in the art would have selected DELESALLE as a starting point to approach the claimed method.

SIDIKOU-SEYNI

SIDIKOU-SEYNI teaches *Cichorium* hybrids designated "474" produced by crossing *Cichorium endivia* and *Cichorium intybus*. As such, these "474" hybrids are F1 hybrid plants, i.e. first generating hybrid plants. These plants are not recombinant plants, like those produced by the claimed method which are at least second generation hybrid plants.

SIDIKOU-SEYNI further teaches a method for the *in vitro* multiplication of the "474" plant. In other words, the further plants obtained according to the SIDIKOU-SEYNI method are clones of the 474 plants, i.e., still F1 hybrid plants and not subsequent generation plants as claimed in the present invention. SIDIKOU-SEYNI does not teach a method for producing F2 and further generation hybrid plants according to the present invention.

Thus, clearly, SIDIKOU-SEYNI only discloses generations F1 hybrid plants and in no case recombinant plants, like those are obtained by the claimed method.

Further, the plants obtained according to SIDIKOU-SEYNI exclusively consist of F1 generation plants, whereas the recombinant plants obtained at the end of the claimed method consist of plants which belong at least from F2 generation plants.

It is herein reminded that when obtaining F1 generation hybrid plants disclosed by SIDIKOU-SEYNI, the alteration of the meiosis events has led to obtaining a weak number of viable F1 hybrid plants, and most of these hybrid plants have been found sterile.

This is precisely the reason why it is underlined that the F1 generation hybrid plants disclosed in SIDIKOU-SEYNI have then been propagated exclusively *in vitro*, through cloning.

More clearly, SIDIKOU-SEYNI has in fact designed a method to obtain young F1 generation plants, starting from F1 generation plant embryos.

Thus, as clearly shown above, the methods taught by DELESALLE and by SIDIKOU-SEYNI are completely distinct. It is thus very unlikely that one skilled in the art would have implemented features from the method taught by SIDIKOU-SEYNI in the method taught by DELESALLE.

Further, even if one skilled in the art would have combined the teachings of SIDIKOU-SEYNI with those of DELESALLE, the combination would not even approach the claimed method.

Particularly, DELESALLE and SIDIKOU-SEYNI, in combination, fail to teach the claimed method steps b), c) and d) for the simple fact that none of these steps are disclosed, even in theory, neither by DELESALLE nor by SIDIKOU-SEYNI.

CASTANO

CASTANO teaches five chicory hybrid plants that all are *Cichorium intybus* chicory cultivar. CASTANO describes incompatibility reactions of these five *Cichorium intybus* chicory cultivars, showing that all the tested cultivars were intra-compatible (pollination with the same cultivar) and cross-compatible among them, with a difference in the percentage of viable seeds when cultivars were self-pollinated and intra-pollinated.

However, CASTANO fails to teach or suggest crossing *Cichorium endivia* with *Cichorium intybus* to produce hybrid cultivars. Indeed, CASTANO does not teach anything about compatibility reactions of crosses between *Cichorium endivia* and *Cichorium intybus*.

Thus, as CASTANO describes incompatibility reactions between various chicory cultivars, CASTANO would not have incited one skilled in the art to perform the claimed method.

Further, CASTANO fails to remedy the deficiencies of DELESALLE, SIDIKOU-SEYNI, or the combination of these two publications for reference purposes to even approach the combination of features of the claimed method.

In fact, there are essential features of the claimed method that are not taught by any of the cited publications. For example, step d) of forcing, and importantly the specific temperature conditions of step d) which are specified in claim 1 enable the production of sufficiently developed young plants to be further cloned in next step e), and wherein the said young plants possess characteristics of satisfactory sanitary quality so that such plant has been subsequently *in vitro* cloned (see from page 6, line 34 to page 7, line 23 of the specification).

In view of the reasons discussed above, the claimed method is not rendered obvious by the proposed combination nor are the various recombinant plants that are obtained by performing the claimed method.

Therefore, withdrawal of the rejection is respectfully requested.

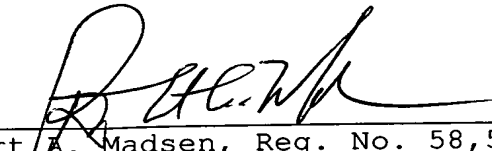
In view of the amendment to the claims and the foregoing remarks, the application is in condition for allowance at the time of the next Official Action. Allowance and passage to issue on that basis is respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any

overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

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